

AMENDMENTS TO THE CLAIMS

1-4. (cancelled).

5. (currently amended) A side pocket mandrel comprising:

- a. an axially elongated tube having an enlarged diameter section terminated at distal ends by asymmetric assembly joints;
- b. ~~an asymmetric flow channel along an inner volume of~~ formed in said enlarged diameter section tube between said assembly joints;
- c. ~~a cylinder bore enclosure within said inner volume, lateral of said flow channel and between said assembly joints, said cylinder bore enclosure having a length that is less than half the length of said tube inner volume~~;
- d. ~~a normally unoccupied channel of workspace within said inner volume extending from said cylinder bore toward a proximate assembly joint; and~~;
- e. (c) an unclaimed portion of said inner volume beyond said flow channel, said cylinder bore enclosure and said workspace channel being substantially occupied by filler material a filler material positioned in said inner volume, said filler material preventing cement from occupying a substantial volume within said inner volume while also allowing placement of a valve element.

6. (Original) A side pocket mandrel as described by claim 5 wherein said filler material comprises surface discontinuities formed to induce fluid flow turbulence.

7. (Original) A side pocket mandrel as described by claim 6 wherein said

surface discontinuities comprise surface upsets.

8. (Original) A side pocket mandrel as described by claim 6 wherein said surface discontinuities comprise transverse jet channels.

9. (Original) A side pocket mandrel as described by claim 5 wherein said filler material comprises a plurality of independent increments.

10. (Original) A side pocket mandrel as described by claim 9 wherein each of said independent increments of filler material is separated from adjacent increments.

11. (Original) A side pocket mandrel as described by claim 9 wherein each of said independent increments of filler material is welded to a tube wall enclosing said inner volume.

12. (Original) A side pocket mandrel as described by claim 9 wherein said filler material is aligned in substantially parallel rows on opposite sides of said workspace channel.

13-14. (cancelled)

15. (new) A side pocket mandrel as described by claim 5, wherein said filler material comprises a plurality of guide sections.

16. (new) A side pocket mandrel as described by claim 5 further comprising a cylinder bore enclosure positioned in said inner volume.

17. (new) A side pocket mandrel as described by claim 16, wherein at least one of said guide sections is positioned axially below said cylinder bore enclosure.
18. (new) An apparatus for insertion into a tubing string disposed in a wellbore, comprising:
- (a) a tubular body having an enlarged diameter section, the enlarged diameter section generating turbulent flow when a working fluid flows therethrough.
19. (new) The apparatus of claim 18 wherein the turbulent flow substantially flushes a residual cement out of said enlarged diameter section.
20. (new) The apparatus of claim 18 wherein the enlarged diameter section cooperates with a plug pushed by the working fluid to displace cement out of the enlarged diameter section.
21. (new) The apparatus of claim 19 further comprising a mass object positioned within said enlarged diameter section that guides said plug therethrough.
22. (new) The apparatus of claim 19 further comprising a valve housing formed within said enlarged diameter section.
23. (new) The apparatus of claim 22 wherein the enlarged diameter section includes a channel for insertion of a valve element into said valve housing.
24. (new) The apparatus of claim 18 wherein the enlarged diameter section has an interior volume that includes a surface discontinuity that induces the fluid flow turbulence.

25. (new) The apparatus as described by claim 24 wherein said surface discontinuity includes one of (i) surface upsets, (ii) indentations, and (iii) transverse jet channels.
26. (new) The apparatus as described by claim 24 wherein said surface discontinuity is formed in a filler positioned in said enlarged diameter section.
27. (new) A production string producing a fluid from a wellbore drilled in a subterranean formation, comprising:
- (a) a production tube adapted to be at least partially cemented in the wellbore; and
 - (b) at least one mandrel positioned along said production tubing, the mandrel having an enlarged diameter section generating turbulent flow when a working fluid flows therethrough.
28. (new) The production string of claim 27, wherein the at least one mandrel includes an upper and a lower assembly joint each having a diameter smaller than a diameter of the enlarged diameter section, said upper and lower assembly joints separated by a length selected to maintain a pressure on a plug traveling through said mandrel.
29. (new) The production string of claim 28 further comprising a guide positioned in said mandrel, said guide keeping said plug within a primary flow bore axis of said mandrel.
30. (new) The production string of claim 27 further comprising a guide positioned in

said mandrel, said guide keeping said plug within a primary flow bore axis of said mandrel.

31. (new) The production string of claim 27 wherein said enlarged diameter section includes a channel for insertion of a valve element into said valve housing.
32. (new) The production string of claim 27 wherein said enlarged diameter section has an interior volume that includes a surface discontinuity that induces the fluid flow turbulence.
33. (new) The production string of claim 27 wherein said surface discontinuity includes one of (i) surface upsets, (ii) indentations, and (iii) transverse jet channels.